NAVAJO AREA OFFICE

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Company Name: U.S. E.P.A. Verify:
Company Address: 75 Hawthorne Street
City/State/Zip: San Francisco, California 94105

Sender's Name: Charles O. Dowell, NAIHS Phone: 602/871-5852

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Navajo Area Indian Health Service
NAIHS Complex - P.O. Box "G"
Highway 264 (St.Michaels)
Window Rock, Arizona 86515

JUN 17 1991

Butch and Gary,

Reference May 17 EPA Action memo:

I have independently shared the following with you both, but since I will be out of the office on travel and leave beginning 20 June, I thought it might be good to put this on paper.

1. Page 4 of the memo mentions the ingestion of contaminated meat as a potential exposure pathway. It is inappropriate to mention this here without some explanation of the basis for its inclusion.

   If we refer to the study done some years ago related to Church Rock, there is no justification for making reference to the meat.

2. Page 6, No. 1, State and Local Actions does not mention any State or IHS activity. According to Butch IHS has not done a lot, but I think it appropriate that we are mentioned.

3. Page 9, VII. The first sentance is incomplete.

Aside from these comments I have some concern about the steps being taken to remediate some of the area. I definitely concur that the safety issues should be addressed. What I don't concur with is the decision to take action based on the radiation levels observed and the assumptions made.

- the data has not documented exposure levels for the population
- the medical records of people living in the area have not been examined
- this sets a precedent which could be used on any number of sites on the Navajo
- there are considerably more pressing needs to which the funds could be applied
- the guideline of 300uR/hr is based on an unproven assumption

Based on this I suggest that we go on record in support of efforts to minimize safety concerns. At the same time, we should indicate that additional data is needed before other steps to remediate the area are taken. This may be difficult to do without sounding as if we are not concerned about radiation.

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DEPARTMENT OF HEALTH & HUMAN SERVICES Public Health Service

MEMORANDUM

Navajo Area
Indian Health Service
P. O. Box G
Window Rock, Arizona 86515

June 25, 1991

To: Robert Bornstein, On-Scene Coordinator, ERS, (H-8-3)

Thru: Director, OEHE

From: Deputy Chief, OHSMB, NAIHS
Health Physicist, OHSMB, NAIHS

Subject: Comments on the May 17, 1991 draft ACTION MEMORANDUM, "Request for Removal Action Approval at the Bluewater Uranium Mine Sites, Prewitt, Navajo Nation, New Mexico".

The following comments are made regarding the standards referenced and mitigation plans suggested in the above document.

1. The regulatory limits established in 40 CFR 192 appear to be inappropriately referenced. This standard applies only to uranium mills, not mines. Justification is required to apply the standard non-mill sites. The control measures outlined in the action memorandum do not meet the requirements of 40 CFR 192, if this standard is to be applied.

   DISCUSSION: The standards promulgated in 40 CFR Part 192 under authority of the Uranium Mill Tailings Radiation Control Act of 1978 (the Act) apply, by statute, to only those uranium by-products materials that are the direct result of a uranium extraction or concentration process, and only to those sites designated by the Secretary of Energy under Section 102 of the Act. This specifically excludes, by definition, their applicability to the situation at the Bluewater sites. The radiation hazards associated with these sites are the result of abandoned mine wastes and ores, not mills. Justification for applying the standards of 40 CFR Part 192 to the remediation of these sites should be further developed. This should include, but not be limited to, an assessment of the provision in 40 CFR Part 192 that control measures be designed to; "Be effective for up to one thousand years, to the extent reasonably achievable, and, in any case, for at least 200 years .. (Subpart A, 192.02)".

2. The estimate of excess exposure appears to have been calculated inaccurately and underestimates the excess exposure to the population. The excess exposure to the population is 344 mrem/yr not 60 mrem/yr as listed in the action memorandum.

   DISCUSSION: NCRP report No. 94, Exposure of the Population in the United States and Canada from Natural Background Radiation, estimates the average total background radiation exposure from all sources to the U.S. population to be approximately 300 mrem/yr. This includes exposure to all radiation types, as well as external terrestrial gamma sources. The action document is using the 300 mrem/yr level as allowable from terrestrial sources alone

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and is not including any other background radiation sources. The NCRP estimate assumes normal exposure to background gamma radiations from terrestrial sources. According to your measurements, normal background averages 11 to 13 microR/hr. NCRP assumes the contribution from terrestrial gamma sources constitutes only a fraction of the total average population dose. Therefore, any exposure from terrestrial gamma sources in excess of normal background should be included in the calculation of excess exposure. The calculations inappropriately concluded that annual exposures due to terrestrial gamma sources alone accounts for the total NCRP estimate of average natural background exposure. Using the NCRP's recommendation of limiting excess exposures to less than 100 mrem/yr., the actual excess exposure would be 344 mrem, not the 60 mR/yr. as listed in the action memorandum. The 344 mrem calculation assumes that 1 mR exposure to gamma radiation is equivalent to 1 mrem absorbed dose. The population in question, exposed to an area emitting 300 microR/hr. would receive 344 mrem excess exposure according to the following calculations:

300 microR/hr. x 4 hr. x 300 days/yr. = 360,000 microR/yr.

360,000 microR/yr. = 360 mR/yr.

or 360 mrem/yr exposure from terrestrial sources.

Calculating and subtracting for normal background:

13 microR/hr. x 4 hr. x 300 days/yr. = 15,600 microR/yr.

15,600 microR/yr. = 15.6 mR/yr.

or 15.6 mrem/yr. normal terrestrial background

360 mrem/yr. - 15.6 mrem/yr. = 344.4 mrem/yr. excess exposure.

Therefore, using the NCRP guideline of limiting excess exposures to less than 100 mrem/yr., remediations should be designed to reduce excess terrestrial exposures to less than 83.3 microR/hr. as demonstrated by the following calculation:

83.3 microR/hr. x 4 hr. x 300 days/yr. = 99,960 microR/yr.

99,960 microR/yr. = (approximately) 100 mR/yr.

or approximately 100 mrem/yr.

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These calculations assume there will be little or no additional excess exposures due to the presence of excess or abundant radionuclides as the result of population exposure to unreclaimed areas. This is probably an erroneous assumption, which would further complicate the calculation of excess population exposures, and further lower the estimated allowable excess exposure due to terrestrial gamma exposures.

3. The cover plans do not seem to meet the intent of UMTRA.

On Page 1 we said UMTRA should not apply!!?

DISCUSSION: There is no life expectancy listed for the mitigation plan proposed in the action document. UMTRA sites are designed to have a life expectancy of at least 200 years. In this arid climate, and with the chronic problem of overgrazing the effectiveness of the 1 foot of top soil cover is questionable. Even with seeding the area the overgrazing problem will allow limited plant growth and compounded with our limited rainfall, getting adequate vegetative cover seems doubtful. Without the stable 1 foot cover the area will be subject to wind and water erosion which can significantly reduce the life of the cover and therefore the effectiveness of the radiation containment.

4. Mining engineering technology should be utilized in sealing all mine openings.

DISCUSSION: More consideration needs to be given to the adit, incline and shaft closure. Particularly, how will subsidence be prevented, especially at the vertical shaft locations. Consideration should be given to utilizing the tailing materials as fill for the adit, incline and shaft closures.

5. The exposure risk may not actually exist.

DISCUSSION: The time spent on the tailings is the basis for the mitigation work. Do individuals actually spend enough time on the tailings to create a hazardous exposure? The 4 hour per day estimate may be overestimating the potential risk. No testing of livestock has occurred to verify or deny effects of "contaminated biota". Additionally, no work has been done to verify migration of tailings as the result of precipitation events or wind.

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6. Fencing should be included in the mitigation plan.

DISCUSSION: Since the only exposure problem identified is related to the general population actually spending time on the tailings and overburden piles the action plan should include a provision for fencing the area. Eliminating access to the area would eliminate the exposure to the population.

These comments are made relating to the design and the rationale of the mitigation plan. We feel that these areas should be critically addressed prior to the final evaluation and remediation of these sites.

Michael A. Taylor
Health Physicist
Occupational Health & Safety Management Branch

Lee A. Shands, MPH, CIH
Deputy Chief
Occupational Health & Safety Management Branch
Navajo Area Indian Health Service

cc: Richard Haskins, Chief, OHSMB